

Amendments to the claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) Axial thrust balancing system (10) for a centrifugal compressor (12), having improved safety characteristics, ~~the~~ said centrifugal compressor (12) comprising a rotor (14) having impellers (16) adjacent to each other and connected by a shaft (18), ~~the~~ said rotor (14) rotating in a stator (20), ~~the~~ said centrifugal compressor (12) including a balancing piston (22), a balancing line (24) being provided between an intake of a first compression stage and an area downstream of the balancing piston (22), characterized in that ~~it~~ said system comprises an intake mechanical gas seal (26) around ~~the~~ said shaft (18) upstream of ~~the~~ said first compression stage and an outlet mechanical gas seal (28) downstream of ~~the~~ said balancing piston (22), ~~the~~ said balancing line (24) being closable by means of blocking elements (32).

2. (Currently Amended) ~~Balancing~~ A balancing system (10) according to Claim 1, ~~characterized in that the~~ wherein said mechanical gas seals (26, 28) are refilled with gas from a supply line (30).

3. (Currently Amended) ~~Balancing~~ A balancing system (10) according to Claim 1, ~~characterized in that the~~ wherein said blocking elements (32) comprise a shut-off valve.

4. (Currently Amended) ~~Balancing~~ A balancing system (10) according to Claim 1, ~~characterized in that the~~ wherein said outlet mechanical gas seal (28) is located at a delivery end of ~~the~~ said compressor (12) and has a function of balancing ~~the~~ said axial thrust.

5. (Canceled)

6. (Currently Amended) ~~Balancing~~ A balancing system (10) according to Claim 1, ~~characterized in that the~~ wherein said outlet gas seal (28) operates with a pressure on a primary ring equal to the delivery pressure of ~~the~~ said compressor (12).

7. (Currently Amended) ~~Balancing~~ A balancing system (10) according to Claim 1, ~~characterized in that~~ wherein, in high-pressure applications of ~~the~~ said centrifugal compressor (12), ~~the~~ said outlet mechanical gas seal (28) is refilled with a supply of gas at high pressure.

8. (Currently Amended) ~~Balancing~~ A balancing system (10) according to Claim 7, ~~characterized in that the~~ wherein said supply line (30) takes the gas from the delivery end of a diffuser of the final compression stage of ~~the~~ said centrifugal compressor (12), ~~immediately upstream of a scroll~~, and, through pipes external to ~~the~~ said centrifugal compressor (12), sends it to a high-pressure filter.

9. (Currently Amended) ~~Balancing~~ A balancing system. (10) according to Claim 8, ~~characterized in that the~~ wherein said gas, taken from ~~the~~ said delivery end of ~~the~~ said diffuser of ~~the~~ said centrifugal compressor (12), is returned into ~~the~~ said centrifugal compressor (12) at the positions of end labyrinth seals of ~~the~~ said centrifugal compressor (12), at the positions of primary rings of ~~the~~ said mechanical gas seals (26, 28).

10. (Currently Amended) ~~Balancing~~ A balancing system (10) according to Claim 1, ~~characterized in that~~ wherein uncertainties in the calculation of the pressures and in ~~the~~ specification of the diameters of ~~the~~ said mechanical gas seals (26, 28) can be compensated for by appropriate pressurization of ~~the~~ primary ring of ~~the~~ said outlet mechanical gas seal (28) and/or that of ~~the~~ said intake mechanical gas seal (26).

11. (Currently Amended) ~~Balancing~~ A balancing system ~~(10)~~ according to Claim 1, ~~characterized in that the~~ wherein said balancing piston ~~(22)~~ is keyed on ~~the~~ said shaft ~~(18)~~ of ~~the~~ said centrifugal compressor ~~(12)~~, downstream of the final compression stage.

12. (Canceled)